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Name

$\because E E X D E R-P E R S E V E R \ldots$

## 

 (NEW AND ENLARGED EDITION)CONTAINING
ARITHMETICAL TABHES AND SICNS, WEIGHTS AND MEASURES, TABLES OF THE METRIC SYSTEM, GEOGRAPHICAL \& DRAWING DFFHNITHONS, And other useful information arranged progressively.

Published by the Proprietor of "BEECHAM'S PILLS," with a view of rendering a small assistance to the Youth of the Country. The publication of Beecham's Help to Scholars commenced in July, 1889 , since when $12,000,000$ have been given away.-October, 18 g8.

## PROPRIETOR:

THOS. BEECHAM, St. Helens, Lancashire.

## BEECHAN'S HELP TO SCHOLARS.

## INTRODUCTION.


#### Abstract

7 HE Proprietor of Beecham's Pills hopes this revised and enfarged edition will be found to meet the requirements of the Education Code; that it will be accorded a hearty welcome in every school in the country; and be carefully preserved for reference.


## HINTS TO PARENTS AS TO SCHOOL ATTENDANCES, \&C. (Applicable to England and Wales only).

Every child between the ages of 5 and I4 must receive efficient elementary instruction in reading, writing, and arithmetic. A child between the ages of II and i4 may be partially or totally exempted from attendance at school, provided he has reached the standard of proficiency fixed by the Bye-Laws of the district.

No child under II years of age may be taken into employment, and no child under is may be employed in a mine, and no girl may work underground.

A child between the ages of II and I 3 may be employed halftime, provided he has reached the standard of proficiency fixed by the Bye-Laws of the district.

No child under I3 may be employed full time under the Factory and Workshop Act, 1878, nor can a child of 13 be so employed unless he has passed the fifth standard, or has made 250 attendances for each of 5 years.

A child between the ages of 13 and 14 years may be emplored half-time even though he has not yet reached the standard of proficiency, or made the requisite number of attendances.

Parents should apply to the School Board or School Attendance Committee for a copy of the Bye-Laws of the district, and read them carefully.

Children suffering from sore eyes, mumps, ferer, whoopingcough, measles, smallpox, chickenpox, or diptheria; or who live in the same house as someone who is suffering from any of these infectious diseases, must not attend school without the express permission of the Head Teacher and Medical Officer, to both of whom a note should be sent.

## BEECHAM'S HELP TO SCHOLARS.

## ARITHMETICAL TERMS, SIGNS, \&C.

All computations in Arithmetic are performed by one of the processes known as

## ADDITION, SURTRACTION, MULTIPLICATION, AND DIVISION.

The terms used in Multiplication are:-
(a) The Multiplier, or number that Multipiies.
(b) The Multiplicand, or number to be Multiplied
(c) The Product, or result of the Multiplication.

The terms used in Division are:-
(a) The Dividend, or number to be divided.
(b) The Divisor, or number by which you divide.
(c) The Quotient, or result of the division.

To find the Sum, add the numbers.
Difference, subtract.

$\therefore$ signifies therefore. $\because$ signifies because.
$: \quad: \quad: \quad$ are the signs of proportion.
$6: 14:: 18: 4^{2}$ means, as 6 is to 14 so is 18 to 42 .
$\sqrt{ }$ sign of square root, as $\sqrt{ } 9=3$
$\sqrt[3]{ }, \quad$, cube $\quad, \quad, \quad \sqrt[2]{27}=3$
( ) $\} \quad[\quad$ are brackets, all quantitie
between them are treated as one.
D or d signifies Denarii or pence.
$\begin{array}{lll}\mathrm{S} \text { or } \mathrm{s} & \text { " } & \text { Solidi or } \\ \mathrm{L} \text { or } £ & ", & \text { Libræ or } \\ \% & & \text { per cent. }\end{array}$


## BEECHAM'S HELP TO SCHOLARS.

## NUMERATION TABLE.

Units .................................. I, One
Tens . ..................................21, Twenty-one.
Hundreds ..........................32I, Three Hundred and Twenty-one.
Thousands . . . . . . . . . . . . . . . . . 4,32I, Four Thousand, Three Hundred and Twentyone.
'Tens of Thousands ........54,321, Fifty-four Thousand, Three Hundred and 'I'wenty-one.
IIundreds of Thousands....654,321, Six Hundred and Fifty-four Thousand, Three Hundred and Twenty-one.
Millions ...................7,654,321, Seven Millions, Six Hundred and Fifty-four Thousand, Three Hundred and Twentyone.
Tens of Millions ........87,654,32I, Eighty-seven Millions, Six Hundred and Fifty-four Thousand, Three Hundred and Twenty-one.
Hundreds of Millions . .987,654,321, Nine Hundred and Eighty-seven Millions, Six Hundred and Jifty-four Thousand, Three Hundred and Twenty-one.
A Billion is a Million of Millions, thus expressed, $1,000,000,000,000$. A Trillion, a Million of Billions, expressed by adding six more ciphers.

THE ROMAN NOTATION TABLE.


ADDITION AND SUBTRACTION.


NOTE. -Add I to each number in top line; then $2,3.4$, etc. Repeat the process with other lines, and deal similarly with Subtraction. Compare the results in each line.

BEECHAM'S HERP TO SCHOLARS.
FOR MULTIPLICATION AND DIVISION.

| Twice |  |  | 3 tinues |  |  | 4 tines |  |  | 5 times |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| I | are | 2 | I | are |  | I | are |  | I | are | 5 |
| 2 | , |  | 2 | ,9 |  | 2 | , | 8 | 2 | , | 10 |
| 3 | ,' | 6 | 3 | , , | 9 | 3 | , , | 12 | 3 | , | I 5 |
| 4 | , | 8 | 4 | , , | 12 | 4 | , | 16 | 4 | , | 20 |
| 5 | , | IO | 5 | , |  | 5 | , 9 | 20 | 5 | ,' | 25 |
| 6 | , | 12 | 6 | , | 18 | 6 | , , | 24 | 6 | , | 30 |
| 7 | , | I 4 | 7 | , | 2 I | 7 | ,, | 28 | 7 | , | 35 |
| 8 | ,, | 16 | 8 | , | 24 | 8 | , , | 32 | 8 | ,, | 40 |
| 9 | :, | I 8 | 9 | , | 27 | 9 | , | 36 | 9 | , | 45 |
| IO | ;, | 20 | IO | , | 30 | IO | , | 40 | 10 | , , | 50 |
| I I | , 9 | 22 | I I | , , |  | 11 | , | 44 | I I | ;, |  |
| I 2 | , 9 | $2+$ | I 2 | , | 36 | I 2 | . | 48 | I 2 | ,, | 60 |
|  | trine |  |  | time |  |  | tirnc |  |  | time |  |
| I | are | 6 | I | are | 7 | I | are | 8 | I | are | 9 |
| 2 | ,, | 12 | 2 | ,, | 14 | 2 | ) | 16 | 2 | , | 18 |
| 3 | , | 18 | 3 | , | 2 I | 3 | , | 24 | 3 | , | 27 |
| 4 | ,9 | 24 | 4 | , , | 28 | 4 | , | 32 | 4 | ,, | 36 |
| 5 | ,' | 30 | 5 | ,' | 35 | 5 | , | 40 | 5 | , | 45 |
| 6 | ,' | 36 | 6 | , | 42 | 6 | , | 48 | 6 | , , | 54 |
| 7 | , 9 | 42 | 7 | , | 49 | 7 | , , | 56 | 7 | ,' | 63 |
| 8 | ,9 | 48 | 8 | , | 56 | 8 | , , | 64 | 8 | , | 72 |
| 9 | ,' | 54 | 9 | , | 63 | 9 | , | 72 | 9 | , , | 8 I |
| 10 | ,, | 60 | 10 | , | 70 | 10 | , , | 80 | 10 | , , | 90 |
| I I | ,, | 66 | I I | , | 77 | I I | , | 88 | I I | ,, | 99 |
| I 2 | , | 72 | I 2 | , | 84 | 12 | , | 96 | 12 |  | 108 |
|  | tim |  |  | time |  |  | 2 tim |  |  | tim |  |
| I | are | IO | I | are | I I | I | are | I 2 | I | are | 13 |
| 2 | , | 20 | 2 | , | 22 | 2 | , , | 24 | 2 | " | 26 |
| 3 | ,' | 30 | 3 | , | 33 | 3 | ,, | 36 | 3 | , | 39 |
| 4 | 9 | 40 | 4 | ,' | 44 | 4 | ,, | 48 | 4 | " | 52 |
| 5 | ,' | 50 | 5 | " | 55 | 5 | , | 60 | 5 | " | 65 |
| 6 | , | 60 | 6 |  | 66 | 6 | , |  | 6 |  | 78 |
| 7 | , 9 | 70 | 7 | ,' |  | 7 | , | 84 |  | ', | 9.1 |
| 8 | ,9 | 80 | 8 | ,' | 88 | 8 | , | 96 | 8 |  | 104 |
| 9 | \% | 90 | 9 | , | 99 | 9 | ,, | 108 | 9 | ,9 | 117 |
| 10 | , | 100 | 10 | , | I IO | 10 | ,, | 120 | IO | , | 130 |
| I I | ,' | 110 | I I | ', | I 21 | I I | . 9 | I32 | I I | ,' | 143 |
| I 2 | , , | 120 | I 2 | , | 132 | I 2 | -' | I 44 | I 2 | , | I 56 |

## BEECHAM'S HELP TO SCHOLARS.

FARTHINGS TABLE.


## BEECHAM'S HELP TO SCHOLARS.

## TIME.



DAYS IN EACH MONTH.


## DAYS OF WEEK. QUARTER DAYS.

Sunday
Monday
Tuesday
Wednesday
Thursday Friday
Saturday

Lady Day March 25th Midsummer June $24^{\text {th }}$ Michaelmas

September 29th Christmas

December 25 th

EASNER SUNDAY follows the first full moon, on or after March 2ist;
Whit-Sunday is the 7 th Sunday after.

NOTE. - When the date is divisible by 4 without renainder, it is Leap-Year, as 1896 ; but with the even hundreds,-1600, $\mathbf{1 8 0 0}, \mathrm{I} 900$, the first two figures must be divisible by 4 if it is a Leap-Year.

## SEASONS.

| Spring begins | $\ldots$ | 2rst March | $\ldots .$. | Spring Equinox | . |
| :--- | :--- | :--- | :--- | :--- | :--- | | I2 hours day |
| :--- |
| I2 |

## ASTRONOMICAL SIGNS.

## SIX NORTHERN SIGNS.

Aries, the ram .. Mar. 2I
Taurus, the bull . . Apl. 20
Gemini, the twins May 21 ) Signs
Cancer, the crab June 21
Leo, the lion .. July 23
Virgo, the virgin Aug. 23

Summer
Signs

## SIX SOUTHERN SIGNS.

Libra, the balance .. Sep. 23 \Autumn
$\left.\begin{array}{l}\text { Scorpio, the scorpion Oct. } 23 \\ \text { Sagittarius the archer Nov. } 20\end{array}\right\}$ Signs
$\left.\begin{array}{l}\begin{array}{l}\text { Capricornus, the goat Dec. } 21 \\ \text { Aquarius, the water } \\ \text { bcarer } \\ \text { Pisces, the fishes }\end{array} \\ \text {.. Jan. } 20 \\ \text { Peb. 18 }\end{array}\right\} \begin{aligned} & \text { Winter } \\ & \text { Signs }\end{aligned}$

## BEECHAM'S HELP TO SCHOLARS.

## AVOIRDUPOIS WEIGHT.

if Drams . . $437^{1 / 2}$ grains. . I $o z$. 16 Ounces . 7,000 , .. I $7 b$. I4 Lbs. .. .. .. I Stone 28 Pounds or 2 Stones 1 qr. of cut. 4 Quarters or 8 Stones or II2 lbs. I cut. 20 Hundred-weights or 2,240 lbs. I ton

## LONG MEASURE.

I: Inches (in.) .. .. I ft.
Feet . . 36 inches .. I $y d$.
5: Yards ... I Rod, perch, or pole
2. Yards, or 4 Poles .. I Chain

40 Poles or'io Chains, or 220 yards I fur.
8 Furlongs or 80 Chains or 1,760 yards
I ml .
3 Niles .. .. 1 League lea.
7.92 Inches .. .. .. I $7 k$.

Ioo Links .. .. .. I Chain

## SQUARE MEASURE.


CUBIC MEASURE.
1,728 Cubic Inches .. .. I cu. fit.
27 Cubic Feet .. .. I cu. yd.
Note.-Compare square and cubic measures with long measure.

| 144 | $=12 \times 12$ | $9=3 \times 3$ |
| ---: | :--- | :--- |
| 1,728 | $=12 \times 12 \times 12$ | $27=3 \times 3 \times 3$ |
| $30^{1 / 4}=51 / 2 \times 51 / 2$ |  |  |

MEASURE OF CAPACITY.
Dry Measure used for all kmds of Grain.
.. I Pint
$p t$.
2 Pints .. .. I Quart qt.
4 Quarts, or 8 pts I Gallon gal.
2 Gallons .. .. I Peck pk.
4 Pecks .. .. I Bumh il bush.
8 「'ashels .. .. I Q iter qr.

## angular measure.

60 seconds ( ${ }^{\prime \prime}$ ) .. make I minute ${ }^{\prime}$ 60 minutes ( ${ }^{\prime}$ ) . . ,, I degree 0 90 degrees a right angle ", I quadrant i80 "tworight angles,, I semicircle 360 ," or twelve signs ," I circle

## Apparent motion of the Sun.

Sun moves 360 degrees in 24 hours.

| " | " | 15 | " | ," | I hour. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| " | " | I | " | " | 4 minutes. |
| " | " | $1 / 4$ | " | " | I minute. |

60 Geographical, or $691 / 2$ English Miles I degree $\left(1^{\ominus}\right)$ of Latitude.
A degree of Longitude varies in lencth according to the Latitude, because all the meridian circles meet at the poles.
In Latitude $50^{\circ}$ a degree measures 44.35 English miles. In Latitude $60^{\circ}$ a degree measures $34^{\circ} 5$ English miles.

## MISCELLANEOUS.

2 Articles .. make I Brace, Couple, or Pair
I2 Articles ..,$\quad$.. I Dozen
I2 Dozen .. ," .. I Gross

12 Gross . . ,, 1 Great Gross
20 Articles .. , , . I Score
2. Sheets of l'aper , . . I Quire

I20 Sheets .. ", . 5 Quires
20 Quires .. ", .. I Ream

## OLD APOTHECARIES WEIGHT.

| 20 | Grains |  |  | I ser |
| :---: | :---: | :---: | :---: | :---: |
| 3 | Scruples |  | rains . | I $d \%$ |
| 8 | Drams | . 480 | ,, | $10 z$ |
| 12 | Ounces | 5,ร60 | , |  |
|  |  | Y W | GH |  |
|  | in weigh | ng gold | sitio | . |
|  | Grains (g | . | Penny | duct. |
|  | Pennywei | hts. | 80 gra | I oz. |
|  | Ounces | . 5 | 60 gra | I lb. |

## BEECHAM'S HELP TO SCHOLARS.

## PRACTICE TABLE.

## Parts of a Pound.

| $s$. | $d$. |  |  |
| :---: | :---: | :---: | ---: |
| $I O$ | 0 | $\cdots$ | $\frac{1}{2}$ |
| 6 | 8 | $\cdots$ | $\frac{1}{33}$ |
| 5 | 0 | $\cdots$ | $\frac{1}{4}$ |
| 4 | 0 | $\cdots$ | $\frac{1}{3}$ |
| 3 | 4 | $\cdots$ | $\frac{1}{6}$ |
| 2 | 6 | $\cdots$ | $\frac{1}{8}$ |
| 2 | 0 | $\cdots$ | $\frac{1}{10}$ |
| 1 | 8 | $\cdots$ | $\frac{1}{10}$ |
| 1 | 4 | $\cdots$ | $\frac{1}{15}$ |
| 1 | 3 | $\cdots$ | $\frac{1}{16}$ |
| 1 | 0 | $\cdots$ | $\frac{1}{20}$ |
| 0 | 8 | $\cdots$ | $\frac{1}{30}$ |
| 0 | $7 \frac{1}{2}$ | $\cdots$ | $\frac{1}{32}$ |
| 0 | 6 | $\cdots$ | $\frac{1}{40}$ |
| 0 | 4 | $\cdots$ | $\frac{1}{60}$ |
| 0 | 3 | $\cdots$ | $\frac{1}{80}$ |
| 0 | 2 | $\cdots$ | $\frac{1}{120}$ |
| 0 | $1 \frac{1}{2}$ | $\cdots$ | $\frac{1}{160}$ |
| 0 | 1 | $\cdots$ | $\frac{1}{240}$ |

Parts of a Shilling. d.


Parts of a Year.

| 292 | dars | $\ldots$ |
| ---: | :--- | :--- |
| 219 | $"$ | $\cdots$ |
| 146 | $"$ | $\cdots$ |
| 73 | $"$ | $\cdots$ |
| Parts of a Ton. |  |  | cuts.qrs.


| 10 | O | $\cdots$ | $\frac{1}{2}$ |
| ---: | ---: | :--- | ---: |
| 5 | 0 | $\cdots$ | $\frac{1}{4}$ |
| 4 | 0 | $\cdots$ | $\frac{1}{5}$ |
| 2 | 2 | $\cdots$ | $\frac{1}{8}$ |
| 2 | 0 | $\cdots$ | $\frac{1}{10}$ |
| 1 | 1 | $\cdots$ | $\frac{1}{16}$ |
| 1 | 0 | $\cdots$ | $\frac{1}{120}$ |
| 0 | 2 | $\cdots$ | $\frac{1}{40}$ |
| 0 | 1 | $\cdots$ | $\frac{1}{80}$ |

Parts of a Cwt. qrs.lbs.


Parts of a Quarter.
lbs.

$\frac{1}{2}$
$\frac{1}{4}$
$\frac{1}{7}$
$\frac{1}{8}$
$\frac{1}{14}$
$\frac{1}{16}$
$\frac{1}{28}$

Parts of an Acre.
rds.pls.

| O 0180 p$]^{\text {. }}$ |  |
| :---: | :---: |
| 10 | ,, 40 , |
| c 32 | 2 |
|  |  |
| - 16 |  |
|  |  |

Parts of a Milc.


## BEECHAM'S HELP TO SCHOLARS.

## TABLES OF THE "METRIC SYSTEM."

## LENGTH.

| Myriametre | $=$ | 10,000 metres |
| :--- | :--- | ---: |
| Kilometre | $=$ | 1,000 |
| Hectometre | $=$ | 100 |
| Decametre | $=$ | Io ", |

METRE $=$ The io millionth part of a quarter of a meridian circle.
Decimetre $=\quad{ }^{\text {I }}$ metres
Centimetre = or "
Millimetre $=$ oor ,
A Metre $=39^{\circ} 37$ inches.

## SURFACE MEASURE

For Walls, Floors, Paper, Glass, \&c.
The SQUARE METRE containsioo Square Decimetres.
10,000 ", Centimetres.
I,000,000 ,, Millimetres.

## SURFACE MEASURE

for Fields, Woods, \&c.
Hectare $=$ Ioo ares.
ARE = 100 Square Metres
Centiare $={ }^{\circ}$ or of an are.
An Are $=119.6033$ Square Yards.

## VOLUME MEASURE

 For Wine, Oil, Wheat, Apples, \&c.The Kilolitre $=$ I,ooo litres
, Hectolitre = 100 ,
, Decalitre = 10 ",
LITRE $=$ I Cubic Decimetre
The Decilitre $=\cdot$ I litres
, Centilitre $=$ or ",
,"Millilitre = oor ",
A Litre of distilled water weighs I Kilogramme, and equals $1 \cdot y 6077$ pints.

MEASURE OF SOLIDITY
For Masonry, Capacity of Docks, \&c.
The Unit is the CUBIC METRE which contains-

I,ooo cubic Decimetres. 1,000,000 ,, Centimetres. 1,000,000,000 ", Millimetres.

## MEASURE OF SOLIDITY

For Firewood, Ropes, Dye-woods, \&c.
The Decastere $=$ Io steres. STERE = I Cubic Metre
The Decistere $={ }^{\prime}$ I ${ }^{\text {teres. }}$ The Stere $=1$ cub. $y d .8 .31655 \mathrm{cub}$. ft.

## WEIGHT.

The Millier =r,ooo kilogrammes
,, Metric Quintal = 100
,, Myriagramme $=$ г $\quad$,
,, Kilogramme $=1,000$ grammes
, Hectogramme = $100 \quad$,
,, Decagramme $=$ io "
GRAMME $=$ a Cubic Centimetre of distilled water at $39^{1} / 2^{\circ} \mathrm{F}$, weighed in a vacuum.

The Decigramme $={ }^{\text {I }}$ grammes
, Centigramme $={ }^{\circ}$ or "
, Milligramme $=$.oor "
A Gramme $={ }^{\circ} 56438$ drams

The Monetary Unit is the FRANC $=9{ }_{5}^{3}$ pence.
The Franc $=$ io Decimes.
," " = 100 Centimes.
20 one-franc pieces and 20 two-franc pieces placed in line measure a metre.

## BEECHAM'S HELP TO SCHOLARS.

## MENTAL ARITHMETIC AIDS.

## A NUMBER WILL DIVIDE BY

2 when last figure is even or a cypher.
3 when the sum of the digits can be divided by 3 .
4 when the last two figures can be divided by 4 or are cyphers.
5 when last figure is 5 or 0 .
6 when last figure is even or 0 and sum of digits will divide by ?.
8 when the last 3 figures can be divided by 8 or are cyphers.
9 when the sum of the digits can be divided by 9 .
25 when last 2 figures are o's or will divide by 25 .
125 when last 3 figures are o's or will divide by 125.
37 and III when the No. is composed of the same 3 digits e.g., 333 IIr.

## To mult 2 ply by

5 add I cypher and divide by 2

| 25 | " | 2 | " | ', | " | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 125 | " | 3 | " | " | " | 8 |
| 625 | , | 4 | " | " | " | I6 |
| 10 | " | I | cyph |  |  |  |
| 100 | , | 2 | cyph |  |  |  |
| I,000 | , | 3 | , |  |  |  |

## To divide by

5 multiply by 2 and place a - before last figure.


To multiply a numaber consisting of two digits by II, add the figures together and place the result between them as $71 \times I I=78$.

To find a year's income (Sundays included) at a given rate per day:-Take a sovereign, a half-sovereign, and fivepence as many times as there are pennies in the given rate. To find a year's income (excluding Sundays):-Take a sovereign and six shillings and a penny as many times as there are pennies in the given rate.

To find the cost of any number of articles when the price is an aliquot part of a sovereign :-Take the number as sovereigns and divide by the aliquot part.

$$
2,786 \text { at } 3 / 4 \text { each : } 2,786 \text { divided by } 6=£ 4646 \mathrm{~s} .8 \mathrm{~d} .
$$

Simple Interest Formulæ. I.-Interest $=$ Principal $\times$ Rate $\times$ Time $\div$ Ioo. 2.-Principal $=$ Interest $\times$ Ioo $\div$ Rate and Time. 3.-Rate $=$ Interest $\times$ Ioo $\div$ Principal and Time. 4.-Time $=$ Interest $\times 100 \div$ Principal and Rate.

Mensuration Formulx. I.-Area of square, rectangle, rhombus or rhomboid $=$ base $X$ height. Base $=$ area $\div$ height. Height $=$ area $\div$ base. 2.-Area of Triangle $=\frac{1}{2}$ base $X$ height. 3.-Area of circle $=$ diameter squared $X \cdot 7854$, or $=$ radius squared X 3.1416. 4.- Circumference $_{=}^{=}$diameter $\times$3.1416. 5.Cubical contents of a box or volume of a solid $=$ length $X$ breadth $X$ lieight. Length $=$ volume $\div$ breadth and height. Breadth $=$ volume $\div$ length and height. Height $=$ volume $\div$ length and breadth.

Vulgar \& Decimal Fractions.

| = | 5 |
| :---: | :---: |
| , | -25 |
|  | - -5 |
| ,' | 15 |
| , 9 | -125 |
| ,' | -315 |
| , | -625 |
| , | .875 |
| , | $\cdot 2$ |
| , | - 4 |
| , | - 6 |
|  | - 8 |
| " | 8 |
| , | - 3 |
| ,' | . 6 |
| , | - i |
|  |  |
| 9 | $\cdot 2$ |
| , | -16 |

## EEECHAN'S HELP TO SCHOLARS.

|  | TOTS. |  |  |  | INVO | OLU | UIO |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Squar | e of |  |  | Cube |  |
| I. | 2,061,562 |  |  | 13 is | 169 |  |  |  |  |
| 2. | 907,029 | 6 |  | 14. | 196 |  | 2 | . | 8 |
| 3. | 7,650,090 |  |  | I 5 . | 225 |  | 3 | . |  |
| 4. | 940,208 | 3 |  | 16 . | 256 |  | 4 | . |  |
| 5. | 539,073 | 2 | 7 | 17 .. | 289 |  | 5 | . | 125 |
| 6. | 5,320,911 | 17 | 6 | I8 . . | 324 |  | 6 | . . | 216 |
| 7. | 4,009,412 | 0 | II | 19. | 361 |  | 7 | . | 343 |
| 8. | 908,090 |  | $1 \mathrm{I} \frac{3}{4}$ | 20 . | 400 |  | 8 | . . | 512 |
| 9. | 9,016,904 | II | $9 \frac{1}{2}$ | 30 . | 900 |  | 9 | . | 729 |
| 10. | 290,230 | 1 I | $2 \frac{1}{4}$ | 40 . | I,600 |  | 10 | . . I | 1,000 |
| II. | 6,780, 129 | 9 | 6 | 50 .. | 2,500 |  | I I | . I | 1,331 |
| 12. | '2, I I I | 8 | 6 |  |  |  |  |  |  |
| 13. | 560, 180 | 2 | - | Reverse th | se for | Squ | are an | Cube | Roots |
| 14. | 58, I I8 | 15 | O $\frac{1}{2}$ |  |  |  |  |  |  |
| 15. | 8,040,177 | 16 |  |  |  | ISC | OUN | TS. |  |
| 16. | 8,23I,960 | I | $8 \frac{1}{2}$ |  |  |  | d. |  |  |
| 17. | 9,901,855 | 19 | 5 | I $\frac{1}{4}$ | \% is | 0 | 3 | tl | 2 |
| 18. | 121,700 | 7 | 5 | $1 \frac{1}{2}$ |  |  |  |  |  |
| 19. | III, OOI | 4 | 3 | 2 | , | O |  | , |  |
| 20. | 2,514,098 |  |  | $2 \frac{1}{2}$ | , | $\bigcirc$ |  | ,' |  |
| 21. | 3,060,826 |  | 6 | 3 | " | $\bigcirc$ |  | ," |  |
| 22. | 4,859,008 |  | $7 \frac{3}{4}$ | 31 | , | 0 |  | ,' |  |
| 23. | 143,904 |  |  | 4 | , | 0 |  | ,', |  |
| 24. | 702,700 |  | 9.1 | 4 $\frac{1}{2}$ | ", |  |  | ,' |  |
| 25. | 67,890,123 |  | 8 | 5 | " | I |  | ," |  |
| 26. | 2,030,405 |  | $9 \frac{3}{4}$ | 6 | " | I |  | ,', |  |
| 27. | 60 |  | $0 \frac{1}{2}$ | $7 \frac{1}{2}$ | , | 1 |  | ,, |  |
| 28. | III | 15 | 10 | 10 | , | 2 |  | ", |  |
| 29. | 70,077 |  | $8 \frac{1}{4}$ | $12 \frac{1}{2}$ | , | 2 | 6 | ,' |  |
| 30. | 999,008 | 12 |  | 15 | , | 3 | 0 | ", |  |
|  | 42,120,232 |  |  | $17 \frac{1}{2}$ | ', | 3 | 6 | ,, |  |
|  | 6,600,001 | 7 |  | 20 | , | 4 | $\stackrel{\ominus}{6}$ | , |  |
| 33. | 555,506 | 14 | $3^{\frac{1}{3}}$ | $22 \frac{1}{2}$ | ,' | 4 | 6 | , |  |
|  | subtract the | es n |  | 25 | ", | 5 | $\bigcirc$ | ', |  |
| by yo | teacher and use | the pe | unds | 50 | " | 10 | 0 | ,, |  |
| colum | only for simple | ts. |  | 75 | ," | 15 | $\bigcirc$ | ,' |  |

## BEECHAM'S HELP TO SCHOLARS.

## ON THE USE OF CAPITAL LETTERS.

Capitals, or great letters, shouid be used :-
r. At the beginning of every piece of writing, and after every full stop.
2. The names and titles of persons, and the names of countries, provinces, cities, towns, villages, hamlets, streets, mountains, rivers, seas, ships, feasts and great events must begin with capıtals.
3. The pronoun I, and the interjecticn O ! must be written in capitals.
4. Quotations must begin with capitals.
5. The first word of every line in puetry must begin with a capital.
6. All the names of God must be written in capitals, e.g., The Almighty; The Saviour.
7. Adjectives derived from the names of persons or places must begin with capitals, as English, Scottish.
8. The names of the principal articles in catalogues, bills of parcels, handbills, direction of letters, titles of books, \&c., should begin with capitals.

FULL STOPS (or periods) must be placed-
r. At the end of every sentence.
2. After every abbreviation.

QUOTATION MARKS OR INVERTED COMMAS. The exact words spoken by someone, or quoted from a book, must be placed within quotation marks,-e.g.:-The boy cried, "Mary is here."
A point of INTERROGATION is placed after every question,-e.g., Where are you?
An EXCLAMATION point follows such words as Oh! Alas! Hurrah! Hush! The APOSTROPHE denotes ownership or else the omission of a letter, John's ; Boys'; I'll; Can't; U'er; E'er'; Didn't: Musn't.
The letter $\mathbf{H}$ is not ASPIRATED in these words:-herb, hour, heir, heiress, honest, honour, hospital, hostler, humour, humble, humility, and in other words formed from these.
When writing a letter, put the address and date in the top right hand corner and sign your full name at the end.

Envelopes should be addressed in this manner:-

Nir. Thomas Beecham,<br>Proprictor of Beecham's Pills,

## St. Helems,

## Lancashire.

## BEECHAM'S HELP TO SCHOLARS.

## GEOGRAPHICAL DEFINITIONS.

Geography teaches about the surface of the earth. This surface is composed of Land and Water. If we were to divide it into four parts, three would be water, and one land.

The Earth is a planet or moving star. In shape it is like an orange. It moves in two ways: Ist, round itself, in 24 hours, causing Day and Night; 2nd, round the Sun, in $365^{\frac{1}{4}}$ days, causing the Four Seasons, Spring, Summer, Autumn, Winter.

A map of a Hemisphere is a plan of half the earth. It may be Northern, lying North of the Equator; Southern, lying South; Eastern, containing Europe, Asia, Africa, and Australia; Western, containing North and South America.

The Axis is the supposed line round which the earth turns. Its ends are called the N. and S. Poles. The diameter, or distance through the earth, is 8,000 miles. The circumference, or the distance round the outside, is 25,000 miles. The Equator is a supposed line passing round the earth, midway between the Poles.

Latitude is distance North or South of the Equator, measured in degrees up to $90^{\circ}$, each $=69 \frac{1}{2}$ English miles. A Meridian is a line passing half way round the earth from the N. Pole to the S. Pole. The line passing through Greenwich is called our First Meridian, and is marked $0^{\circ}$ on English maps. Longitude is distance East or West of the First Meridian. In Great Britain the lengtli of degree of longitude varies from 34 miles in the N ., to 45 miles in the S . A Zone is a belt or girdle passing round the earth. There are 5 ; one Torrid, very hot round about the Equator; two Frigid, very cold, one surrounding each Pole; and two Temperate, between the Torrid and Frigid zones.

- A Continent is the largest division of land. There are 5; Asia, America, Africa, Europe, Australia.

A Country is part of a continent, having a particular name. England, Scotland, Ireland, Wales, France, Spain, Germany.

A County or Shire is part of a country ; sometimes called a Province, or Department, Canton, State, \&c.

A Riding (Trything) is a third part of a county. Yorkshire is so divided.
An Island is a portion of land surrounded by water.
A Peninsula is a piece of land nearly surrounded by water.
An Isthmus is a narrow neck of land joining two large divisions.
A Cape is a point of land stretching into the sea. Other names are Head, Ness, Naze, Mull, Butt, Promontory, Foreland, Point, Bill.

A Coast or Shore is the land washed by the sea. A Beach is the portion of a shore which is alternately covered and uncovered by the tide.

A Hill is a high mass of land, under 1,000 feet.
A Mountain is a mass of land over r,ooo feet high; an isolated mountain is a Peak; several peaks form a Group; connected mountaizis form a Chain or Range; a mountain flinging out steam, ashes, and melted rock or lava, is a Volcano.
1 A Plain is a level portion of land, at no great height above the level of the sea. The plains in South Russia and Central Asia are termed Steppes, and are generally uncultivated. In North America, they are called Prairies and Savannalis; and in South America, Llanos and Pampas.

## BEECHAM'S HELP TO SCHOLARS.

## GEOGRAPHICAL DEFINITIONS.-continued.

A Table land or Plateau is a level portion of land at a considerable elevation.
A Valley is low land, bounded on each side by hills. Other names are Vale, Dale, Glen, Gorge, Strath. A Ravine is a long hollow between hills.

A Desert is a barren tract of land. A Cliff is the vertical face of a mountain or rocky sea-shore.

An Oasis is a green spot in a desert, containing trees and a spring of water.
An Ocean is the largest division of salt water. There are 5; Pacific, Atlantic, Indian, Antarctic, Arctic. A Sea is part of an ocean ; if studded with islands, it is called an Archipelago. A Gulf or Bay is a portion of water extending into the land. An Estuary is the wide mouth of a river, which is only filled with water when the tide flows in, and exhibits a long stretch of sand or mud when the tide ebbs. Other names are Aber and Firth. A Harbour or Haven is an inlet of the sea, where ships can shelter. A Creek or Cove is a small inlet of the sea. In Australia and America a river is often called a Creek. A place where ships can anchor near a coast is called a Roadstead or Road. A Strait is a narrow neck of water joining two large portions. A Channel is similar to a strait, but longer and wider.

A Lake is a portion of water surrounded by land; small lakes are termed Pools or Meres ; if in high land or among mountains, Tarns ; if shallow and filled with sea water, Lagoons. In Ireland, lakes are called Loughs; in Scotland, Lochs. A Lagoon is also the name given to the calm water inside a ring-shaped coral island.

A Spring is water flowing out of the earth, and generally forms the beginning of a river.

A River is a running stream of fresh water, issuing from a hill, or other high land, and generally flowing into the sea. The beginning is its Source; the ending, its Mouth; the sides, its Banks; little streams running into it, its Feeders, Tributaries or Affiluents; where the water lies, its Bed. The land drained by one river and its tributaries is its Basin.

The high land dividing two basins is the Waterparting; and the slopes down which the streams run, form the Watershed. A Rivulet, Brook, or Streamlet, is a little river. A Confluence is a place where two rivers unite. The right and left Banks of a river take their names from the Course, or direction in which the water runs. An artificial river is called a canal.

A Waterfall is a place where the water of a river falls from a higher to a lower level. A Cataract is a large waterfall. A Rapid is a place where the bed of a river slopes, causing the river to run swiftly. A Cascade is formed when the river runs down a steep, rocky bed.

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## BEECHAM'S HELP TO SCHOLARS.

## DRAWING DEFINITIONS.

## A Pjint has position, but not size.

A Line has length, but not breadth.
A Straight (or right) Line is the shortest distance between two points, and is shorter than a curved line.
A Vertical line is upricht.
A Horizontal line is level.
An Oblique line is sloping.
Perpendicular lines are those which form right angles; they are not always vertical. A line cannot be perpendicular by itself.
Parallel lines are the same distance apart every where: they never meet.
An Angle is a corner made by two lines which meet at a point.
A Right Angle is a square corner, and is formed of perpendicular lines.
An Obtuse Angle is greater than a right angle.
An Acute Angle is less than a right angle.
A Superficies is a surface, flat or curved.
A Plane is a perfectly flat surface and is either vertical, horizontal, or slanting. A figure is a surface enclosed by three or more lines, straight or curved. Two straight lines cannoí enclose a space.
Plane Figures, such as Squares, Triangles, Circles, ana Hexagons, have only length and breadth, and lie completely on one surface.
Triangles are figures with three angles: they are called Trilaterals also, because they have three sides.
An Equilateral (or Equiangular) Triangle has three equal sides and three equal angles.
An Isosceles Triangle has two equal sides and two equal angles.
A Scalene Triangle has no sides and no ancrles equal.
A Right-angled Triangle contains one right angle
An Obtuse-angled Triangle contains one obtuse angle.
An Acute-angled Triangle contains three acute angles.
The Base is the line on which the Triangle stands. The Altitude is the height. The Apex or Vertex is the top point.
Quadrilaterals are figures with four sides: they are called Quadrangles also, because they have four angles.
A Square has four equal sides and four right angles.
A Rhombus has four equal sides but its angles are not right angles.
A Rectangle or Oblong has its opposite sides equal, and its angles are right angles.
A Rhomboil has its opposite sides equal, but its angles are not right angles.
A Parallelogram has its opposite sides parallel.
A Quarry is a square standing on one of its corners.
A Diamond is a rhombus standing on one of its corners.
A Diagonal is the line joining opposite angles of a quadrilateral.
A Diameter is the line joining the centres of opposite sides.

## BEECHAM'S HELP TO SCHOLARS.

## DRAWING DEFINITIONS.-continued.

Pelygons are figures with many angles. They are Regular when the angles and sides are all equal; but Irregular when they are of various sizes.
A Pentagon is a figure with five equal angles and five equal sides; Hexagon, six ; Heptagon, seven ; Octagon, eight; Nonagon, nine; Decagon, ten; Undecagon, cleven; Duodecagon, twelve.
A Circle is a figure formed by a curved line called the circumference. The Circumference, or Periphery, is the continuous curved line which forms a circle. The Centre is a point in the middle of the circle. A Radius is a line drawn from the centre to the circumference. All the Radii in one circle are equal in lengtl.
A D:ameter is a straight line through the centre from circumference to circumference.
A Chord is a straight line across a circle, but not through the centre.
A Tangent is a line touching a circle. An Arc is any part of the circumference.
A Semicircle is half a circle. A Quadrant is quarter of a circle.
A Circle contains $360^{\circ} \quad$ A Right Angle $=90^{\circ}$
$45^{\circ}=$ half a Right Angle. $30^{\circ}=$ one-third of a Right Angle.
A Segrment is a piece cut off a circle by a chord.
A Sector is a part of a circle enclosed by an are and two radii.
An Ellipse is a figure bounded by a continuous curved line, and is longer than it is broad. A true tillipse is not oval or egg-shaped. The Major Axis is longer than the Minor Axis.
A Trapezium has no sides equal or parallel.
A Trapezoid has four unequal sides, but two sỉes are parallel.
Solids have length, breadth, and heimh (or depth, or thickness) and have two or more surfaces, as a cone, cylinder, cube, pyramid, prism or sphere.
A Model or Perspective drawing represents an object (sometimes in outline only) as it appears to the eye.
A Plan is a drawing of the actual shape of the surface covered by an object viewed from above. An Elevation is is drawind of the actual sliape of the surface covered by an object viewed from the front or side.
A Scale druwing is the representation of an object one-half, one-third, one-tenth, or sume other fraction of its real size. Scale $\frac{1}{2}$ means that a line $\frac{1}{2}$-in. long represents something which is $1-\mathrm{in}$. long; and a line 6 -in. long represents something $12-\mathrm{in}$. long; scale $\frac{1}{10}$ means that $\frac{1}{10}$ inch represents 1 inch; and $\psi_{0}^{2}$ inch represents 12 inches, or I foot. Scale $\frac{1}{8}$ means $\frac{1}{8}$ inch represents 1 inch; and $\frac{3}{8}$ inch represents 3 inches; and $\lambda_{k}{ }^{2}$ inch represents 12 inclies. Scalc,$\frac{1}{2}$ means that $I_{2}$ inch represents 1 inch ; $\bar{r}_{2}$ inch represents 5 inclies ; $f_{2}^{2}$ inch represents 12 inches $; \frac{77}{2}$ inch represents 17 inches.

## BEECHAN'S HELP TO SCHOLARS.

## COMMON ERRORS IN COMPOSITION.

We was going (were), I be a good cricketer (am). He went to lay down (lie). That ain't right (is not). He never done anything (did). I could have went (gone) It do not matter (does). It have contracted (has). Let $I$ do it (me). He went their (there). We saw there house (their). Has he as been before (as he has). I have no books for they (them). That was her (she). I know who I saw (whom). He stands between you and $I$ (me). The lion who chased us is dead (which). We know the man which watched us (who). The horse having been in the field (had).

Do not use the superlative degree of adjectives, as tallest, most beautiful, instead of the comparative, as taller, more beautiful, when comparing two things.

Adjectives should not be used for adverbs, as He ran very quick (quickly). Use and, but, then, and so as seldom as possible, especially at the beginning of a sentence.

Do not use pronouns so often as to confuse two persons together-He told him he was going to his house. Observe the rules of punctuation.

## PRINCIPAL PREFIXES.

## LATIN.

a, ab, abs, from, by. ad, to, at.
lamb, around, both.
ante, before.
circum, around.
con, col, with, together. contra, against.
de, down, from, concerning
di, or dis, apart.
e, ex, out of, beyond. extra, beyond.
in, lm, in, into, not. inter, between.
intro, within. ob, against, in the way of per, through.
post, after.
pres, before.
pro, forward.
re, back, again.
se, apart, aside.
sub, under.
super, over. [yod. trans, or tra, across, beGREEK.
amphi, both.
ana, up, again.
data, down.
dit, through.
en, or em, into.
ep, on, upon, over.
hypo, under.
para, or par, besides.
syn, or sym, with, toen, to make, in. [gether. fore, before.
mic, wrong, not.
out, beyond.
over, above.
un, not.
with, against.

## LETTERING FOR MAPS, \&c.

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz1234567890

$A B C D E F G H I J R I M N O P Q R S T U V W X Y Z$ abcdefghijklmnopqrstuvwxyz1234567890 ABCDEFGHIdKLMNOPQRSTUV WY

## BEECHAM'S HELP TO SCHOLARS.

## ABBREVIATIONS AND COMMON PHRASES.

A 1 First Class; A.B. Able Seaman Aee., Aet. Aecount<br>[Lord<br>A.D. (Anno Domini) in the year of our<br>A.M. Before noon ; P.M. After noon<br>Anon. Anonymous-without a name<br>B.A. Bachelor of Arts; M.A. Master of<br>B.C. Before Christ [Arts<br>Britt. Reg. Queen of the Britons<br>B.P. British Public-Beecham's Pills<br>C.C. County Couneil<br>Cf. Compare ; q.v. whieh see<br>Col. Colonel ; Capt. Captain<br>Cr. Creditor; Dr. Debtor or Doctor<br>D.D. Doctor of Divinity<br>D.G. By the Grace of God<br>Do. ditto. The same<br>D.V. God willing<br>Ed. Editor ; Esq. Esquire<br>e.g. For example; Ex. Example<br>Fahr. Fahrenheit ; C. Centigrade<br>F.D. Defender of the Faith<br>F.R.S. Fellow of the Royal Society<br>G.P.O. General Post Offiee<br>H.MS. Her Majesty's ship<br>H.R.H. His or Her Royal Highness<br>Ibid. in the same place<br>i.e. (id est) that is<br>Inst. Instant, this month

Alias. .Otherwise
A la mode. . Aeeording to the fashion
A propos. . To the point
Au revoir . Adieu till we meet again
Bonâ fide. .In good faith
Bon marché. .Cheap market
Dieu et mon droit. . God and my right
Esprit de eorps. .The animating spirit of a number of persons
Felo de se.. Suieide
Honi soit qui mal y pense. .Evil to him who evil thinks
Ich dien. I serve; In toto. .Eintirely In statu quo. . In the former state Inter alia. Among other things Lapsus linguæ. . A slip of the tongue L'humme propose, et Dieיı dispose. . Man proposes and God disposes
I.H.S. Jesus, Saviour of men
J.P. Justice of the Peace

Lat. Latitude; Long. Longitude
Licut. Lieutenant; Gen. General
M.D. Doetor of Medieine

Mem. Memoranda, Notes
Messrs. Messieurs, Sirs
Mr. Mister ; Mirs. Mistress
M.P. Member of Parlizment

MSS. Manuseripts
N. Nortli ; E. East; W. West; S. South
N.B. Note, or mark well

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Pro tem. for the time being
Prox. Next Month; Llt. Past Month
P.S. Postseript
P.T.O. Please turn over

Rev. Reverend
S. or: St. Saint
S.S. Steamship
T.C. Town Couneillor
U.S.A. United States of Americ?

Viz. Namely; V.C. Victoria Cross
V.R. Vietoria, the Queen
\&c. ete. (et ectera) and others
I2.S.T.P. Reply, if you please

Multum in parvo. . Much in little
Nom de plume. .An assumed title
Non eomposmentis. Not in sound mind Pater Noster..Our Father
Pons asinorum. . The ass's bridge
Poste restante. .To remain till ealled for
Pro bono publico.. For the publičgood Pro ratit. In proportion
Quicl pro quo.. One thing for another Tempus fugit. .Time flies
Terra firma. . Solid earth; afe footing Tout ensemble. The whole taken t -
Versus. Against
[gether
Viî.. 13 y the way of
Viea vershi. The reverse
Tox populi. . The voiee of the poople
In re.. In the matter of
Sine qua non. . Someth ne in 'ispensable


